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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/028,432 | 12/28/2001 | Myoung Goo Lee | 0630-12902 | 4397 |

2292 7590 07/03/2002

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EXAMINER

LANDAU, MATTHEW C

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2815

DATE MAILED: 07/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

10/028,432

Applicant(s)

LEE ET AL.

Examiner

Matthew Landau

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-- The MAILING DATE of this c mmunication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 28 January 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on January 28, 2002, has been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3, 4, 8, 11-13, 16, 19 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claims 3, 12, and 19, the limitation “connected to Vcc” renders the claims indefinite. The specification does not define Vcc, therefore it is unclear what voltage Vcc represents.

In regards to claims 4, 13, and 20, the limitation “connected to Vss” renders the claims indefinite. The specification does not define Vss, therefore it is unclear what voltage Vss represents.

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In regards to claims 8 and 16, the term "substantially" is a relative term which renders the claims indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Therefore, it cannot be determined what is meant by one object having substantially the same shape as another object.

In regards to claim 11, the limitation "each" in line 17 renders the claim indefinite. According to the claim, the possibility exists to have only one second active region. The term "each" can only be used if there is more than one second active region. Thus, the claim language is inconsistent.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

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5. Claims 1, 2, 3, 5-12, and 14-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsukude.

In regards to claim 1, Figure 8 of Tsukude discloses a multi-finger type ESD protection device comprising: a semiconductor substrate; a plurality of first active regions (2a/2b/2c) formed separately on the semiconductor substrate; and a pair of gates (3a, 3b) formed in each of the first active regions (2a/2b/2c).

In regards to claim 2, Figure 8 of Tsukude discloses at least one second active region (16e, 16f) of a predetermined conductive type formed additionally between the first active regions (2a/2b/2c).

In regards to claim 3, Figure 1 of Tsukude discloses the first active region (2a/2b/2c) is n-type and the substrate is p-type. Tsukude also teaches that the second active region (16e, 16f) is connected to the power supply node, which is considered to be Vcc, in order to form a field transistor between the first active region (2a/2b/2c) and the second active region (2a/2b/2c). Since the first active region (2a/2b/2c) is n-type and the substrate is p-type, second active region (16e, 16f) must inherently be n-type in order to establish a field transistor between the two regions to be established (see column 9, lines 63-67). Therefore, Tsukude discloses the second active region (16e, 16f) includes an n+ junction connected to Vcc.

In regards to claim 5, Figure 8 of Tsukude discloses a plurality of drain regions (2a, 2c) formed in each of the first active regions (2a/2b/2c).

In regards to claim 6, Figure 8 of Tsukude discloses a pair of drain regions (2a, 2c) formed at n+ junctions of both end portions of each of the first active regions (2a/2b/2c).

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In regards to claim 7, Figure 8 of Tsukude discloses a plurality of source regions 2b each formed between the pair of gates in each of the first active regions.

In regards to claim 8, Figure 8 of Tsukude discloses the first and second active regions and the gates extend substantially parallel to each other.

In regards to claim 9, Figure 8 of Tsukude discloses the first and second active regions and the gates have a substantially same shape.

In regards to claim 10, Figure 8 of Tsukude discloses a third active region (16c/16d) surrounding the first (2a/2b/2c) and second (16e, 16f) active regions.

In regards to claim 11, Figure 8 of Tsukude discloses a multi-finger type ESD protection device comprising: a semiconductor substrate; a plurality of first active regions (2a/2b/2c) formed separately on the semiconductor substrate; a plurality of gates (3a, 3b) formed in each of the first active regions (2a/2b/2c), and at least one predetermined conductive type second active region (16e, 16f) formed between two of the first active regions (2a/2b/2c).

In regards to claim 12, Figure 1 of Tsukude discloses the first active region (2a/2b/2c) is n-type and the substrate is p-type. Tsukude also teaches that the second active region (16e, 16f) is connected to the power supply node, which is considered to be Vcc, in order to form a field transistor between the first active region (2a/2b/2c) and the second active region (2a/2b/2c). Since the first active region (2a/2b/2c) is n-type and the substrate is p-type, second active region (16e, 16f) must inherently be n-type in order to establish a field transistor between the two regions to be established (see column 9, lines 63-67). Therefore, Tsukude discloses the second active region (16e, 16f) includes an n+ junction connected to Vcc.

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In regards to claim 15, Figure 8 of Tsukude discloses source regions 2b formed between two gates in each of the first active regions (2a/2b/2c).

In regards to claim 16, Figure 8 of Tsukude discloses the first (2a/2b/2c) and second (16e, 16f) active regions and the gates extend substantially parallel to each other and have a substantially same shape.

In regards to claim 17, Figure 8 of Tsukude discloses a third active region (16c/16d) surrounding the first (2a/2b/2c) and second (16e, 16f) active regions.

In regards to claim 18, Figure 8 of Tsukude discloses a multi-finger type ESD protection device comprising: a semiconductor substrate; a plurality of first active regions (2a/2b/2c) formed separately on the semiconductor substrate; and a pair of gates (3a, 3b) formed in each of the first active regions (2a/2b/2c); drain regions (2a, 2c) formed at n⁺ junctions of both end portions of the first active regions (2a/2b/2c); source regions 2b formed between the pair of gates in each of the first active regions; and at least one second active region (16e, 16f) of a predetermined conductive type, formed between the first active regions (2a/2b/2c).

In regards to claim 19, Figure 1 of Tsukude discloses the first active region (2a/2b/2c) is n-type and the substrate is p-type. Tsukude also teaches that the second active region (16e, 16f) is connected to the power supply node, which is considered to be V_{cc}, in order to form a field transistor between the first active region (2a/2b/2c) and the second active region (2a/2b/2c). Since the first active region (2a/2b/2c) is n-type and the substrate is p-type, second active region (16e, 16f) must inherently be n-type in order to establish a field transistor between the two regions to be established (see column 9, lines 63-67). Therefore, Tsukude discloses the second active region (16e, 16f) includes an n⁺ junction connected to V_{cc}.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4, 13, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukude in view of Lee et al.

In regards to claim 4, the difference between Tsukude and the claimed invention is the second active region including a p+ junction connected to Vss. Figure 6 of Lee et al. discloses a plurality of first active regions (510/530), a gate formed in each first active region (510/530), a second active region 550 formed between the first active regions (510/530), and a third active region 560 surrounding the first and second active regions, wherein the second active region 550 includes a p+ junction connected to ground, which is considered to be Vss. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Tsukude by forming the second active region with a p+ junction connected to Vss. The ordinary artisan would have been motivated to modify Tsukude in the manner described above for providing a discharge path for an ESD pulse applied to the first active region.

In regards to claim 13, the difference between Tsukude and the claimed invention is the second active region including a p+ junction connected to Vss. Figure 6 of Lee et al. discloses a

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plurality of first active regions (510/530), a gate formed in each first active region (510/530), a second active region 550 formed between the first active regions (510/530), and a third active region 560 surrounding the first and second active regions, wherein the second active region 550 includes a p+ junction connected to ground, which is considered to be Vss. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Tsukude by forming the second active region with a p+ junction connected to Vss. The ordinary artisan would have been motivated to modify Tsukude in the manner described above for providing a discharge path for an ESD pulse applied to the first active region.

In regards to claim 20, the difference between Tsukude and the claimed invention is the second active region including a p+ junction connected to Vss. Figure 6 of Lee et al. discloses a plurality of first active regions (510/530), a gate formed in each first active region (510/530), a second active region 550 formed between the first active regions (510/530), and a third active region 560 surrounding the first and second active regions, wherein the second active region 550 includes a p+ junction connected to ground, which is considered to be Vss. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Tsukude by forming the second active region with a p+ junction connected to Vss. The ordinary artisan would have been motivated to modify Tsukude in the manner described above for providing a discharge path for an ESD pulse applied to the first active region.

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Conclusion


8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. It discloses a pair of gates discloses a first active region with a pair of gates formed in said active region.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (703) 305-4396.

The examiner can normally be reached on 8:00 AM-4: 30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



EDDIE LEE
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TECHNOLOGY CENTER 2800

Matthew C. Landau

Examiner

June 28, 2002